

CLEMSON

IMPACTS



CLEMSON UNIVERSITY PUBLIC SERVICE ACTIVITIES - WINTER 2009



Sorghum as Biofuel
Corridor of Opportunity
Families Eating Better
Camp Hannon

Vice President's Message



Normally this column gives an overview of reports you'll find in *Clemson Impacts*. This time, though, I would like to update you on the state funding crisis. Clemson Public Service Activities (PSA) is facing unprecedented cuts, which threaten vital services we provide for the state's agriculture and forestry industry.

After three rounds of budget cuts from July through December, our state funding is down 21% from last year. This is the same level as in 1989, without adjusting for inflation or the increase in the state's population. To deal with cuts of this magnitude, we have implemented a mandatory five-day furlough and a

hiring freeze, eliminated vacant and temporary positions, significantly reduced operating expenses, and deferred much needed renovations to animal research farms.

We expect next year's state funding to be as low, or even lower, than the current year. It is impossible to sustain this level of budget cuts without reducing programs that serve the citizens of South Carolina. We are taking a thoughtful, strategic approach to maintain the critical research and education programs that are core to our mission of stimulating economic development for the state's \$34 billion agriculture and forestry sector.

A tentative date of April has been set to complete the review. Some decisions may be made sooner; others may take longer because of their complexity. We will share information as soon as decisions and timetables are established.

Thank you for your patience during this very trying time. Your support for Clemson PSA is needed now more than ever, despite the sad reality that diminishing resources will likely reduce PSA programs when they are most needed for South Carolina's economic recovery.

Sincerely,

John W. Kelly
Vice President for Public Service and Agriculture

Knowledge for living.
Knowledge for life.

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Clemson Impacts, a quarterly publication of Clemson Public Service Activities, is available to South Carolina residents upon request. *Clemson Impacts* is also available on the web www.clemson.edu/public/

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A noble muscadine harvest

By Peter Hull

Unusually heavy rains during harvest time did little to dampen the latest crop of muscadine grapes at the Pee Dee Research and Education Center in Florence.

"The leading variety, the Noble, yielded about 8 tons per acre during the fall harvest, about a ton more per acre than the previous year," said Jody Martin, Extension agent and program leader.

Heavy rain during harvest time did not affect the crop's sugar content, which often can wash some of the grape's sugars out, impairing flavor. Once the harvest was complete, he pruned the vines in preparation for next season.

"In April we'll start fertilization and irrigation to get the vines cranked up again," Martin said.

The harvested grapes were sold at market value to a winery in Conway and the proceeds were reinvested in the program. The crop is likely to peak in about three years, when the harvest could reach 10 tons per acre.

For more information: Jody Martin, 843-661-4800 x 115, jamrtn@clermson.edu.



Photo by Tom Lollis

Cattlemen's Day attracts more than 150 people

By Peter Hull

The first Cattlemen's Day was held Oct. 11 at the annual Forage Bull Test Sale, in partnership with Clemson Extension and the S.C. Cattlemen's Association.

Forty-seven purebred bulls were sold at the auction, hosted by the Edisto Research and Education Center near Blackville. All the cattle passed strict tests in the months leading up to the auction but the average sale this year was \$1,501, down \$772 from last year.

"Unfortunately, the cattle industry is affected by an economic downturn just like everything else," said Larry Olson, Extension animal scientist and Bull Testing Program coordinator.

Further, two years of drought in South Carolina has affected the number of cows in the state, which in turn has reduced the number of bulls required.

For more information: Larry Olson, 803-284-3343 x 231, lolson@clermson.edu.



Photo by Peter Hull

Sorghum is more than just sweet syrup

By Peter Kent

South Carolina uses nearly 2.5 times more energy than it produces, according to U.S. Energy Information Administration 2005 data. While the state does not have oil, natural gas or coal resources, biofuels from crops show promise as renewable energy sources that can be produced here.

Grass genomicist Alex Feltus is analyzing 400 varieties of sorghum, seeking the ones most easily converted into fuels. Using computer programs he helped develop, Feltus searches the plant's genes for the ones that make sugars that can become ethanol and hydrogen. Identifying the genes is only the first step. Through collaborations with other scientists he is involved in sorghum plant breeding and in helping bio-energy producers improve the sugar-to-fuel conversion process.

In addition to aiding development of renewable energy in South Carolina, his discoveries of genetic information in sorghum – such as drought tolerance, pest resistance and improved yields – will also benefit producers of related crops, including corn, rice and turfgrass.

For more information: Alex Feltus, 864-656-3231, ffeltus@clermson.edu.



Photo by Peter Kent

Sumter livestock producers invest in new veterinarians



Photo by Peter Kent

By Peter Kent

As animal health issues change the need expands for veterinarians who know how to face new challenges to public health and the livestock industry. These include international agricultural emergencies, such as avian influenza, as well as improving livestock genetics and reproduction rates.

To ensure South Carolina has enough veterinarians, livestock producers in Sumter County have created a scholarship fund for students study veterinary medicine. The scholarships are for students who attend Southeastern vet schools with the expectation that they will stay in the region. Named for a highly respected Sumter veterinarian, the Dr. Robert Beaty-DVM Memorial Scholarship has been awarded to eight students to date.

Howard van Dijk, Clemson Extension animal scientist, works with producers to select scholarship candidates. Dr. Brandon Brunson, a diagnostic pathologist with Clemson's Veterinary Diagnostic Center in Columbia, was the first scholarship holder. The most recent recipient is Kristin Carter, a Clemson graduate in animal and veterinary science who now studies veterinary medicine at the University of Tennessee.

For more information: Howard van Dijk, 803-865-1216 x 128, hdijk@clemson.edu.

Lessons learned abroad help at home

By Peter Kent

As part of a worldwide effort to embrace Integrated Pest Management (IPM), Clemson scientists are exploring alternative methods that use natural elements, such as fungi and bacteria, to control plant pests.

Agricultural economist Mike Hammig and entomologists Merle Shepard and Gerald Carner have been working in Southeast Asia for three decades to analyze IPM techniques and develop training methods.

Their research is conducted in Southeast Asia because of the year-round growing season. Funded by the U.S. Agency for International Development, their findings have helped farmers in Southeast Asia and in South Carolina to save money and protect the environment.

"Farmers, whether they are in Southeast Asia or the Southeastern U.S., constantly have to manage costs and make a living," Hammig said. "IPM gives them one more way of dealing with insects that can decrease harvest yields and profits."

For more information: Michael Hammig, 864-656-8281, mhammig@clemson.edu.



Photo by Gerald Carner

Georgetown entrepreneurs take FastTrac to grow

By Peter Hull

Eight small businesses completed the first FastTrac course held in Georgetown County, each looking for ways to grow their new companies into big successes.

The weekly classes were held this fall, facilitated by Will Culler with the Institute for Economic and Community Development. He serves as Clemson's statewide representative for FastTrac, a coalition of education and business groups that help entrepreneurs create, manage and grow prosperous businesses.

"Small businesses are the backbone of the community," Culler said. "FastTrac gives them tools to succeed and grow."

Small classes allow for close interaction among the participants. Businesses often are retail-based, but the Georgetown class came mostly from service industries, reflecting the make-up of the area. Participants included a freelance writer, landscape architect, Web site designer and a real estate agent.

For more information:

Will Culler, 803-206-9795, wculler@clemson.edu or www.fasttracsc.org.



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Corridor of opportunity

By Peter Hull

A group of 17 Clemson graduate and undergraduate students have a rare opportunity to give back to the community as part of their planning and landscape architecture studies.

Led by assistant professor Victoria Chanse, the students held a series of public meetings with officials and residents of the Stromboli area in North Charleston. They produced seven design proposals for revitalizing the historically black neighborhood located barely a mile from Clemson's Restoration Institute.

"An important component of the project is to give back to the neighborhood in doing something useful rather than just another exercise," Chanse said. "The neighborhood residents can take the students' work and put it into practice, if they choose."

The project includes two key elements, according to Chanse: service-learning and hands-on experience working with a community. As part of the ongoing project, the students will work closely with Stromboli residents as they refine their designs.

For more information: Victoria Chanse, 864-656-6787, vchanse@clemson.edu.



Photo by Peter Hull

Symposium to strengthen families and communities

By Sharon Crout



Photo by IFNL

An international symposium to strengthen families and communities will be held March 30 – April 1 in Greenville. Hosted by Clemson's Institute on Family and Neighborhood Life (IFNL), the symposium is open to social workers, health professionals, educators, researchers, students, and others. Register at www.familysymposium.com.

The theme is "Building Safe, Humane, and Responsive Communities for Children and Families" and celebrates the institute's first decade of service.

"During its 10 years, IFNL has pioneered in making help available to families where they are, when they need it, in a form they can use with ease and without stigma," said Gary Melton, institute director.

The symposium will focus on the experience of children and families in everyday life and in times of crisis. Participants will consider ways in which neighborhood institutions – schools, workplaces, parks, places of worship,

health clinics, police and fire stations – can enhance social assistance to promote the well-being of children and families.

For more information: www.clemson.edu/ifnl or Sharon Crout, 864-250-4626, scrout@clemson.edu.

As environments change, life seeks to fit in

By Peter Kent

Weather patterns and the consequences of wind, rain and temperature profoundly influence life on Earth. Historical biogeographer Peter Marko studies how past changes in climate have impacted species' distribution and abundance. The research shows patterns that can help scientists predict how plant and animal life may respond to global warming.

"Climate change has received the most attention from biologists and paleontologists as a factor affecting ecosystems over geological timescales," Marko said. "There is a growing desire to predict the responses of marine species to increasing global temperatures. Over the span of time, species retain genetic information that tracks how they survived in their environments. I examine these ages-old genetic patterns – think of it as 'genetic archeology.'"

Research by Marko and others offers insights into the long-term consequences of climate change. It also provides data for political and economic decisions about land-use, conservation and environmental policies, such as coastal growth and development.

For more information: Peter Marko, 864-656-1426, pmarko@clemson.edu.

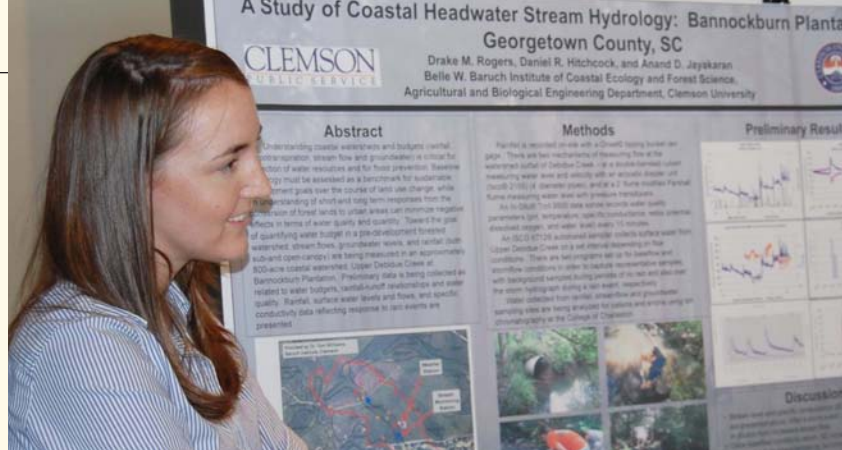


Photo by Peter Hull

Water conference addresses economic impact for state

By Peter Hull

Policy makers and industry leaders gathered at the Charleston Area Convention Center in October for the 2008 S.C. Water Resources Conference.

The two-day conference was organized by the Clemson University Restoration Institute and planned by a group of 19 universities, governmental agencies and industries. More than 350 participants attended 30 concurrent sessions on water quality, conservation, public policy, future needs, land-use planning and economic development.

Speakers included representatives from the state's universities, federal and state agencies, environmental engineering consultants and municipalities. Attorney General Henry McMaster gave the keynote address on the impact of water issues facing South Carolina.

"This conference was about more than water. The issues discussed here affect our quality of life and the economic vitality of South Carolina," said Gene Eidson, Restoration Institute ecology program director and conference chairman.

For more information: Gene Eidson, 864-710-0882, geidson@clemson.edu.



Saving a rainy day

By Peter Hull

Save money and water: make a rain barrel.

"Now more than ever, the use of rain barrels is an important consideration and wise investment for homeowners across South Carolina," said Katie Giacalone, Carolina Clear natural resources coordinator.

Rain barrels reuse rainwater to irrigate gardens and lawns. They also help keep stormwater away from a home's foundation and out of the storm drains, ditches and rivers.

Commercial rain barrels sell for about \$150, but Charleston County Extension agent Dave Joyner showed a class of Master Gardeners how to make a rain barrel for less than \$50. The volunteer gardeners can now conduct classes for the public to encourage water conservation.

"Most people are surprised at the amount of water that comes off their roof," Joyner said. "One inch of rainfall over a 1,000-square-foot roof yields more than 600 gallons of water." The average rainfall in the coastal region is about 50 inches per year.

For more information: David Joyner, 843-722-5940 x 125, djoyner@clemson.edu.

Photo by Peter Hull

Landscaping with the environment, not against it

By Peter Hull

Visitors to the 2008 Coastal Carolina Fair in Ladson experienced a new attraction: how to create yards that work with the environment, not against it.

Master Gardeners, helped by more than a dozen volunteers from local schools, built an outdoor classroom where visitors learn how to be more environmentally conscious in their yards.

The living exhibit, part of Clemson Extension's Carolina Yards and Neighborhoods program, serves as a permanent demonstration area for workshops that include landscape water management and the use of native plant species.

The project was a partnership between Clemson Extension's Master Gardener program, Ladson Exchange Park/Exchange Club and the Ashley-Cooper Stormwater Education Consortium sponsored by Clemson Carolina Clear.

"The demonstration project will be more than a regular attraction at the annual fair," said David Joyner, Charleston County Extension agent. "It will be used as an outdoor classroom for area schools and other groups throughout the year."

For more information: David Joyner, 843-722-5940 125, djoyner@clemson.edu or www.clemson.edu/cyn/.



Photo by Peter Hull

'We all live downstream' the message from Carolina Clear campaign

By Peter Hull

Clemson's stormwater education and awareness program, Carolina Clear, rolled out its first multimedia advertising campaign in November.

Television and radio commercials, and seven billboards across two coastal regions, carry a simple message: "Remember, we all live downstream." The campaign debuted in the Charleston and Myrtle Beach markets before appearing in other regions of the state.

Carolina Clear's goal is to minimize polluted stormwater runoff by educating the general public, youth, builders, developers, homeowners and government officials about how they can keep water in the state's streams, rivers and basins

as clean as possible.

"It is everyone's responsibility, from local governments to

the general public, to keep surface waters free of pollution. Stormwater pollution is people pollution, and we all can play a role in keeping South Carolina's waters clean, drinkable and swimmable for the next generation," said Katie Giacalone, Carolina Clear's statewide coordinator.

For more information: www.clemson.edu/public/carolinaclear/ or Katie Giacalone, 843-554-7226 x 115, kgiacal@clemson.edu.



Mercury: It's not good for fish or fishermen

By Peter Kent

Some fish caught in South Carolina may not be safe to eat because they contain harmful levels of chemicals that cause health problems, especially for children and pregnant women.



Photo by Peter Kent

Environmental chemist Beth Carraway studies how mercury moves through stream and river environments. Organic sediment, such as leaves and grasses, can remove some of the chemical from water. However, certain bacteria can transform mercury into methylmercury that builds up in insects and fish, magnifying the health risks.

"We need to identify how mercury gets into the water and where it poses the greatest concern," said Carraway. "With this information we can make better predictions about exposure levels to people and better choices about how to reduce mercury levels."

Burning coal, other fossil fuels, and even trash – as well as factory smokestacks – can increase the mercury in the air. The metal returns to the earth in rain and ends up in lakes and rivers. The U.S. Geological Service reports that the Southeast in general and the Santee area in particular show above average methylmercury levels.

For more information: Elizabeth Carraway, 864-646-2189, ecarraw@clemson.edu.

Safe food-handling information now in Chinese

By Peter Kent

Take-out and restaurant dining has become a way of life. Making sure foodservice workers practice safe food-handling is an ongoing challenge for public health experts. Without proper training, workers might inadvertently cause a food-borne illness, such as salmonella.

"Chinese is the third most commonly spoken language in U.S. foodservice operations, following English and Spanish," said Angela Fraser, food scientist. "In many areas of the U.S., food safety educators only speak English so it is difficult for them to train Chinese-speaking foodservice workers."

To address this issue, Fraser worked to develop a series of food safety training materials that

are based on U.S. safety standards and are available in both English and Chinese. She was joined by colleagues at New Mexico State University and the Danyun Institute in China.

Materials are available in English and Simplified Chinese at <http://chinese-foodsafety.com/>.

For more information: Angela Fraser, 864-656-3652, afraser@clermson.edu.

Families learn to eat better and move more

By Diane Palmer

Many families haven't had the resources to purchase and prepare healthful foods they need. This leads to obesity and related diseases such as diabetes and cardiovascular disease.

For 40 years, low income families have turned to

Clemson's Expanded Food and Nutrition Education Program (EFNEP) for food and nutrition education. EFNEP is offered in 26 counties and provides a series of lessons based on the USDA's MyPyramid and Dietary Guidelines for Americans.

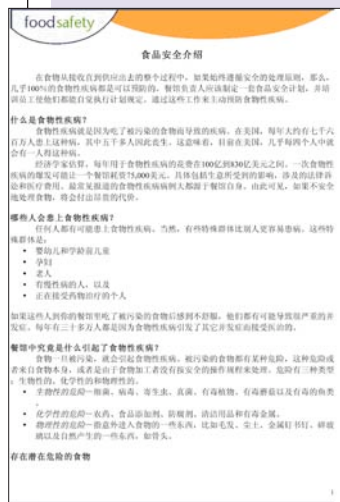
"The hands-on approach helps participants make positive behavior changes in the areas of nutrition, food safety, food resource management and physical activity," said Katherine Cason, EFNEP state coordinator.

In 2008, the program reached 789 families and 8,392 children and youth. Participants report improvement in nutrition practices, physical activity levels, food safety practices and food resource management as a result of the training.

For more information: Katherine Cason, 864-723-4520, kason@clermson.edu.



Photo by Mary Ann Mobley



Veterinary diagnostic laboratory earns top rating

By Peter Kent

Global economic uncertainty will create challenges for U.S. beef and pork exports in many countries, but the main concern for foreign consumers is meat safety.

Clemson's Livestock-Poultry Health unit is responsible for ensuring livestock and poultry health and the safety of meat and poultry products in South Carolina. Inspectors visit livestock farms, auction houses and meat processing plants to ensure animals are healthy and meat products are safe.

The unit's analytical laboratory recently was awarded full accreditation for all species by the American Association of Veterinary Laboratory Diagnosticians.

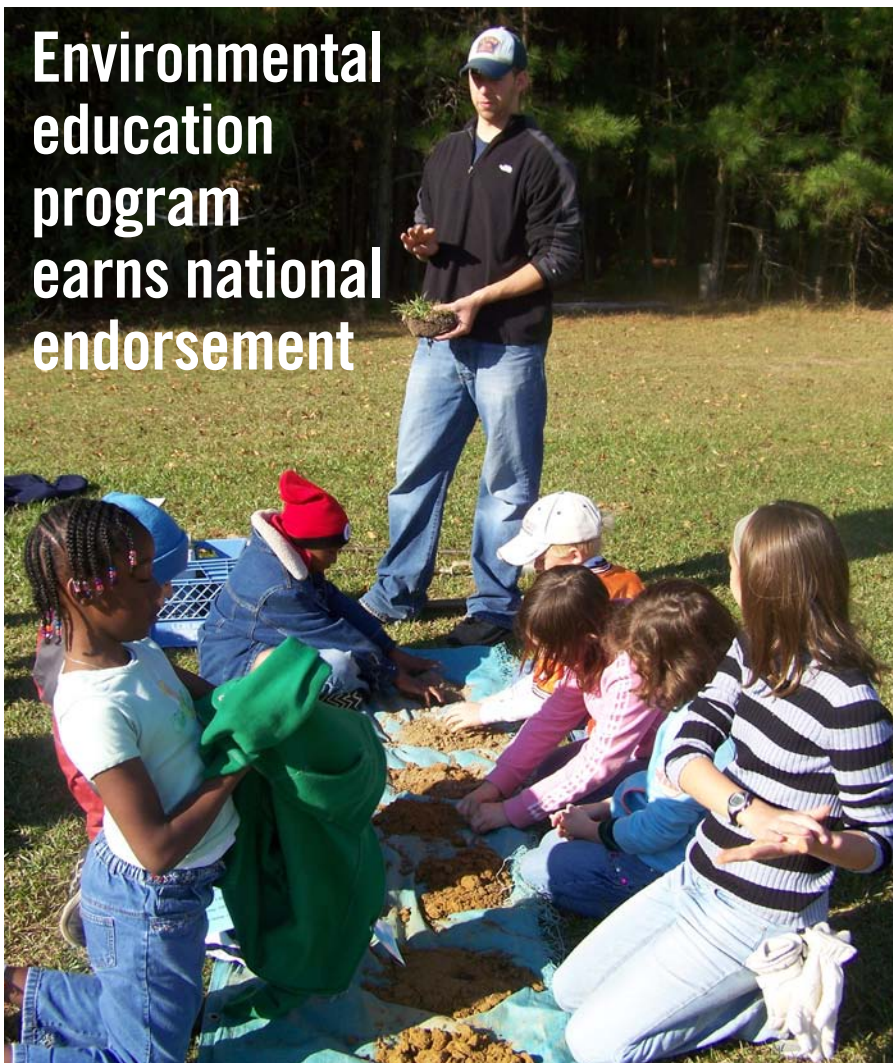
"Full accreditation means our lab meets or exceeds national standards of compliance, proficiency testing, quality assurance, safety and record keeping," said Tony Caver, Livestock-Poultry Health director and state veterinarian. "This ensures that South Carolina meat products are safe for consumers and it meets international testing requirements for export opportunities."

For more information: Tony Caver, 803-788-2260, jcaver@clermson.edu or www.clemson.edu/public/lph/.



Photo by Tom Lollis

Environmental education program earns national endorsement



By Pam Bryant

Photo by Youth Learning Institute

Teaching KATE (Kids About The Environment) has been endorsed by the National Forum on Children and Nature as one of 30 creative demonstration projects across the nation that reconnect kids with nature.

More frequently than ever before, children are developing chronic health conditions, including obesity and depression. There is growing evidence that the decline in children's health is, in part, related to a disconnection from nature and active time outdoors.

"The Forum celebrates these projects for demonstrating how to get kids back outdoors," said Larry Selzer, president and CEO of The Conservation Fund, which hosts the Forum. "This is critical for children's health and for the future of our environment."

Teaching KATE, developed by the Coalition of Natural Resources and Clemson's Youth Learning Institute, was endorsed because of its potential for relevance, impact and an ability to be replicated.

Based at Camp Bob Cooper in Summerton, KATE offers a three-day, residential adventure for third- through fifth-grade students. Through nature hikes, collecting expeditions and group challenges, the students experience more core outdoor education than in three weeks of traditional classroom instruction. Endorsed by the South Carolina Department of Education, KATE has reached more than 70,000 students and teachers since 1991.

For more information: www.clemson.edu/yli/pages/kate.php or Howard Brown, 864-650-4308, wbrown4@clemson.edu.

Students gain new perspective on ability to learn

By Pam Bryant

Many students' path to juvenile detention begins with a troubled history in school, followed by truancy or expulsion and a downward spiral of events.

Nonviolent, low-risk offenders have an opportunity to learn behavior modification and continue their education at the Youth Development Center in Aiken. The center is a partnership of Clemson's Youth Learning Institute (YLI) and the S.C. Department of Juvenile Justice and is located at Camp Long.

Research-based math and reading programs at the center are boosting students' skills by as much as 2.5 grade levels during an average stay of 57 days. Students say the center's program is "more hands on" and offers "a different type of teaching."

In addition, one-week curriculum modules were developed by YLI to provide hands-on experiences in aerospace, zoology, electricity, marine science, horticulture, food and nutrition, and mechanical science. These modules align with state educational standards and integrate language arts, math, science and social studies.

"Our job is to help students believe in themselves and discover their potential," said Cody Greene, center director. "Our hope is that they maintain their momentum for learning and return home with a drive to be successful in school and in life."

For more information: www.clemson.edu/yli/pages/ydcrisk.php or Cody Greene, 803-292-7590, cgreene@clemson.edu.

New Upstate camp could serve thousands each year

By Chris Copeland

Thousands of needy children will have an opportunity for a summer camp experience through a partnership between the Scott Hannon Memorial Foundation and Clemson's Youth Learning Institute.

Called Camp Hannon, the facility will be located at Pinnacle Falls, an 80-acre nature wonderland in northern Pickens County that was donated to Clemson by The Cliffs Communities and its nonprofit foundation, Pinnacle Partners.

"It is amazing to see what collaboration can mean for kids. This partnership endeavor potentially could serve 10,000 to 12,000 children each year through summer and year-round programs," said Stephen Lance, institute chief of staff.

Thomas Buxton, president of the Hannon Foundation, said, "The creation of Camp Hannon will help improve self-esteem and heal the hurts of children by providing hope, love and assistance."

Phase I development of Camp Hannon begins this spring, which includes plans for boys and girls cottages and a 500-seat multipurpose auditorium.

For more information: Stephen Lance, 803-414-1735, slance@clemson.edu or www.scotthannon.com.



Photo by Youth Learning Institute

Cherokee County 4-H helps schools save the environment

By Diane Palmer



Photo by Alana West

Landfills are filling up fast because too many items that could be recycled are thrown away instead. One estimate is that only 30% of discarded materials are recycled. This throw-away mentality threatens to reduce both natural resources and our quality of life.

To raise awareness of the issue, Cherokee County 4-H, in conjunction with the county Recycling Center, conducted a "Reduce-Reuse-Recycle Campaign" in five schools last year. Students, faculty and parents all collected paper to recycle and competed for the title of Cherokee County Recycling Champion.

The goal for each school was to recycle 100 pounds of paper each week during the 12-week campaign. At the end of the program, they had collected a total of 20,616 pounds of paper – more than three times their goal.

"The students, teachers and families made this campaign a tremendous success," said Alana West, 4-H coordinator for the event. "Now we hope they will continue recycling and encourage others to participate also."

For more information: Alana West, 864-489-3141 x 115, awillin@clemson.edu.

Director named for Pee Dee Research and Education Center

By Peter Hull

Bruce A. Fortnum has been named director of the Pee Dee Research and Education Center in Florence after previously serving as interim director.

Fortnum joined Clemson in 1978 as assistant professor of plant pathology and physiology, and is a Clemson University graduate. His primary research area is control of soil-borne diseases and nematodes in tomato, tobacco and related crops.

He has lectured in 24 countries and served as an outside reviewer for research and outreach programs in Venezuela, Argentina, China and South Africa. He has received numerous awards, including the Godley-Snell Award for Excellence in Agricultural Research.



"The faculty and staff at the Pee Dee center are dedicated to help solve problems facing today's agriculture industry," Fortnum said. "It is a pleasure to work with such diverse and committed team members who recognize the issues that are important to rural South Carolina."

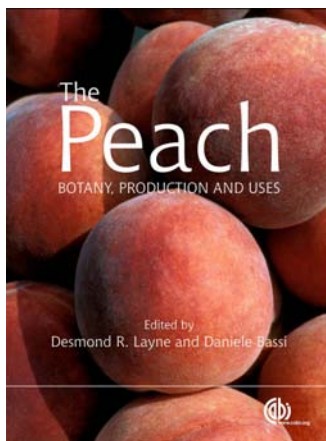
For more information: Bruce Fortnum, 843-662-3526 x 259, bfrtnm@clemson.edu or www.clemson.edu/peedeecol/.

Top dogs at Garrison Arena

The Garrison Arena hosted the first AKC-sanctioned dog show held by the Clemson Kennel Club. More than 1,200 dogs from 27 states and Canada competed, representing 137 different registered breeds. The show brought in 2,000 visitors to see some of the nation's "top dogs." For more information: www.clemson.edu/garrison/.



Photo by Charles Williams



Comprehensive book on growing peaches

By Diane Palmer

A comprehensive book for commercial peach growers or anyone who has an interest in growing peaches is now available.

Titled *The Peach: Botany, Production and Uses*, the 615-page book includes contributions from 40 experts from nine countries. It was edited by Desmond Layne, Clemson Extension fruit specialist, and Daniele Bassi, University of Milan, Italy.

The text addresses botany, taxonomy, genetics, propagation, planting systems, crop and pest management, and postharvest physiology. It also contains a chapter on the history and cultivation of the peach in China going back to 1100 B.C. and 300 color pages. The book can be ordered online through Oxford University Press or Amazon.com.

For more information: Desmond Layne, 864-656-4961, dlayne@clemson.edu.

Beekeepers Association seeks research partners

By Diane Palmer

The honey bee pollinates nearly one-third of the food crops we eat but the number of colonies in the U.S. has declined from about 5.5 million to fewer than 2.4 million. The bees are fighting for survival from attacks by mites, small hive beetles and now the mysterious "colony collapse disorder."

"Keeping enough healthy colonies to ensure the availability of wholesome, nutritious, locally grown fruits and vegetables in South Carolina is becoming more and more difficult," said Mike Hood, Clemson bee specialist.

He is working with the S.C. Beekeepers Association to raise funds for honey bee research. One project, called "Save Our Bees," aims to underwrite small research projects to help local beekeepers. Another would establish an endowment for a Clemson University graduate student to conduct honey bee research. Donations to both funds are tax deductible.

For more information: Mike Hood, 864-656-0346, mhood@clemson.edu.



Photos by Diane Palmer

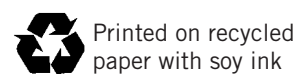


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www.clemson.edu/extension

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Finding high-yield cotton for growers

By Peter Kent

In 2002, only 22 percent of the cotton planted in South Carolina was high-yielding varieties. Clemson scientists are working to improve yields through field studies at the Pee Dee and Edisto Research and Education Centers, as well as on commercial farms.

Each year, some 30 studies evaluate cotton varieties, pesticide systems, plant growth regulators, and harvesting equipment and techniques. They also analyze agronomic practices, such as plant density, planting date, tillage systems and irrigation.

The research has helped to increase per acre cotton yield significantly by developing and identifying varieties that are more weed- and disease-resistant, hardier and more productive.

This information is needed to support the cotton industry, which generates more than \$10 billion in revenue and 100,000 jobs in North and South Carolina.

For more information: Michael Jones,
843-662-3526, majones@clemson.edu

Photo by Tom Lollis